THE MURPHY CHEMICAL COMPANY LIMITED,
WHEATHAMPSTEAD,
HERTS.

ADVISORY BULLETIN No. 7

ON

Winter Washing.

KEEP THESE BULLETINS IN THE GRATIS FILING
COVER WE SUPPLY.

Winter Washing.

THE WASHES.

The three types of winter washes in general use are (a) ordinary or "standard" tar-distillate washes, (b) mineral or petroleum oil washes and (c) mixed tar-petroleum oil washes. For all standard winter spraying against Aphis, Psylla, Caterpillar, etc., tar-distillate washes should be used. Petroleum and mixed tar-petroleum washes are only advised where Capsid or Red Spider is prevalent.

(a) The tar-distillate wash chosen should be of highest quality. Generally, the higher boiling oils have greatest insecticidal efficiency, show better permanence and resistance to rain and by maintaining an unbroken film of oil over insect eggs, give better control than low boiling oils. It is false economy to purchase cheap tar-distillate washes, since they give variable results or have to be used at greater concentrations than normal.

(b) Petroleum oil washes should contain high percentage of high boiling oils; inferior washes, containing low boiling oils, will not give permanence of oil film necessary for Capsid or Red Spider control and are liable to cause damage to trees.

(c) Mixed tar-petroleum washes should contain carefully blended proportions of tar-distillates and petroleum oils, of suitable boiling range. If either or both are unsuitable in this respect, insecticidal efficiency will be lowered and possibility of damage to trees will be considerable.

It is not advisable to mix a tar-distillate and a petroleum wash to obtain a mixed wash, unless previous experience has proved such mixtures to be compatible and not to cause damage under the particular conditions.

THE PESTS.

(1) APHIDES on apple, pear, plum, cherry, damson, currant, gooseberry, loganberry and blackberry.

Eggs oval, black (in most cases), shining, generally laid at bases of buds or in crevices in bark; hatch in spring and resulting wingless aphides multiply rapidly. In some species winged forms appear later in year and migrate to other plants, returning in autumn to lay winter eggs. Best example of migration is Hop-Damson Aphis, cause of Hop Blight. In other species no migration occurs.

Damage to plants consists of loss of vitality, checking of new growth and killing of leaves; fruit drops before ripening (*e.g.* plums), or is distorted and rendered unsaleable (*e.g.* apples).

Eggs are easily killed by efficient tar-distillate wash at 5 to 7½% concentration.

(2) APPLE SUCKER (*Psylla mali*, Schmidb.).

Eggs oval, creamy-white, with small projection at one end; laid principally on fruit spurs. Young bugs flat, yellow, hatch in spring, puncture trusses and feed on sap. They soon become green, and excrete white globules and waxy threads from hind end of bodies; later, wings appear and about six weeks after hatching they become adult; adults live on trees all summer but do not lay eggs until October.

In bad attack buds die unopened, or, wither and turn brown, suggesting frost damage in appearance. Leaves are frequently deformed, stunted and light in colour.

Eggs are easily controlled by efficient application of good tar-distillate wash at 5 to 7½% concentration.

(3) "CATERPILLAR" on most fruit trees and bushes.

Collective name for larvæ of three species of Winter Moths, the true Winter Moth (*Cheimatobia brumata*, L.), the Mottled Umber Moth (*Hybernia defoliaria*, Cl.), and the March Moth (*Anisopteryx aescularia*, Schiff.). Eggs of first two species are placed singly or in small groups, in crevices of bark, often at base of buds and on pruned surfaces. March Moth eggs are laid in bands or rows round twigs, embedded in hairs from hind tuft of female. Eggs of all three species are cylindrical, light green, later becoming rusty red. Females cannot fly and therefore crawl up trunks to lay eggs. In case of first two, this occurs from October to January; with March Moth not until February or March. Eggs hatch in spring and caterpillars spin two leaves together very loosely or attach a leaf to a blossom truss. They feed on leaves and flower buds and later bite pieces out of fruitlets.

In bad attacks almost all leaves and buds may be devoured, with consequent loss of crop and severe check to growth of tree. Caterpillars of Winter and March Moths are difficult to distinguish, both being yellowish-green, with pale lines at sides. Mottled Umber caterpillar is much larger, chestnut brown above, yellow below and at sides. When fully fed, larvae of all three lower themselves to ground by silken thread in May or June and pupate in soil. Moths emerge during autumn or following spring according to species.

Good control can be obtained by efficient application of reliable tar-distillate wash at 10%, but it must be remembered that frequently eggs of March Moth are laid *after* wash has been applied; reported failures of tar-distillate washes to give effective control are often due to March Moth forming predominant species in orchard. In such cases tar-distillate washes should be applied as late as is safe and supplemented by grease banding to trap females climbing trees to lay eggs. Even this will not always give absolute control, as there is evidence that females get carried up trees by winged males when pairing. In cases of bad infestation, therefore, grease banding should be supplemented by lead arsenate spraying at green bud stage. As a rule, however, unless March Moth forms big proportion of species present, routine tar-distillate winter washing is all that is necessary.

(4) SCALE INSECTS.

Brown Scale (*Lecanium corni*, Bouché.) on gooseberry and currant bushes and Mussel Scale (*Mytilaspis pomorum*, Bouché.) on apples and other fruit trees are not usually important pests in commercial orchards. Scale Insects can be controlled by reliable tar-distillate wash at 5 to 7½% concentration.

(5) VAPOURER MOTH (*Orgyia antiqua*, L.)

Common insect in many orchards, but infestation usually not serious. Overwinters in egg stage, eggs are brownish-grey, circular, laid in great numbers on or about empty cocoon of female moth, conspicuous objects in winter attached to twigs. It can be controlled by reliable tar-distillate wash at 5 to 7½% concentration.

(6) CODLIN MOTH (*Cydia pomonella*, L.) and other TORTRIX.

Larvae of Codlin Moth and several Tortrix species overwinter on trees. These include Bud Moth (*Spilonota ocellana*, Fabr.), Apple Fruit or Surface Eating Fruit Tortrix (*Cacoecia podana*, Scop.) and *Batodes angustiorana*, Haw., which is also responsible for damage to fruit in store.

Codlin Moth larvæ are found under crevices, in cracks and underneath loose bark, wrapped in coarse, silk web. Tortrix larvæ spin fine silk cocoon beneath bud scales, in crutches of twigs or under dead leaf attached to twig. These species are little affected by tar-distillate wash unless used at 10% or higher and trees thoroughly soaked, owing to difficulty of reaching them in their sheltered positions. It is important to distinguish these Tortrix larvæ (which are not properly controlled by tar-distillate wash at 10%) from the three species

of Winter Moths which are controlled, provided eggs already laid when wash applied. Tortrix larvæ crawl in normal manner, lying flat on leaf, when touched on head they wriggle violently backwards. Winter Moth larvæ progress by "looping" and do not wriggle backwards when touched.

In addition to these Tortrix which spend winter as larvae on tree, several important species overwinter in egg stage and can be controlled by reliable tar-distillate wash at 10% concentration.

(7) CAPSID BUGS. (*Plesiocoris rugicollis*, F. and *Lygus pabulinus*, L.) on apples and currants.

Generally, ordinary tar-distillate washes are ineffective, but in some cases in official trials have given good control.

[*For detailed account of Capsid control by winter spraying, see The Fruitgrower, October 18th, 1934. Recommendations for the use of petroleum or tar petroleum washes will be given in Advisory Bulletin No. 8.*]

(8) RED SPIDERS.

(a) FRUIT TREE RED SPIDER (*Oligonychus ulmi*, Koch.), on apples, pears, plums and damsons.

Eggs spherical, pink, later becoming brilliant crimson, laid in autumn on twigs, branches and trunk of tree, often crowded together in large numbers. Young spiders emerge in spring, feed on leaves; after moulting several times become adult and lay summer eggs. These quickly hatch, and several more generations appear during summer; in autumn, winter eggs are again deposited on twigs, etc.

Injury to plants is due to loss of sap caused by feeding of the spiders. Affected leaves become dull silvery-grey to yellowish, and in bad attack premature defoliation occurs.

Tar-distillate washes are ineffective against eggs of this pest. It can however be controlled commercially on apples by petroleum oil wash at 7½% in last three weeks in March, if preceded by tar-distillate wash, or at 10% if not so preceded; or by mixed tar-petroleum wash at 10% in late February, provided these washes are applied as efficiently as Capsid sprays.

On plums, pears or damsons petroleum wash should be applied about a month earlier. It is definitely not advisable to use mixed washes on these trees.

(b) GOOSEBERRY RED SPIDER (*Bryobia ribis*, Thom.)

Large proportion of winter eggs hatch late autumn and young spiders remain as such on bushes thoughout winter. Tar-distillate wash thus partially controls this pest at 5 to 7½%, as it kills young spiders, but not eggs.

(9) WOOLLY APHIS. (*Eriosoma lanigerum*, Hausm.)

Routine spraying with tar-distillate wash materially reduces numbers, but owing to protective action of extensive waxy secretion, a few survive and are sufficient to build up a colony again in summer, unless further measures are taken.

RECOMMENDATIONS FOR CONTROL.

(a) Good tar-distillate wash at 5 to 7½% concentration will control Aphis, Psylla, Scale Insects and Vapourer Moth, will partially control Gooseberry Red Spider and reduce infestation of Woolly Aphis. With ideal weather conditions, dry trees and no wind, 5% may be sufficient. With much wind, damp trees, or much moss on branches, it is preferable to use concentration of 7½%.

Good tar-distillate wash at 10% concentration will control "Caterpillar" and Tortrix that overwinter in egg stage, will materially reduce infestation of Woolly Aphis and, to less extent, Codlin Moth and those Tortrix that overwinter as larvæ. Tar-distillate wash will not control Red Spider on top fruits and will not, as a rule, control Capsid Bugs.

(b) Petroleum oil wash at 7½% in late March following tar-distillate wash, or at 10% if not so preceded, will control Capsid and Red Spiders. Applied alone at 7½% to 10% petroleum oil wash will give only partial control of Aphis, Psylla, "Caterpillar," Scale Insects, Tortrix as eggs, Woolly Aphis, Vapourer Moth, and very little, if any, control of Codlin Moth and Tortrix as larvæ.

(c) Mixed tar-petroleum oil wash at 10% in February will control Aphis, Psylla, Scale Insects, "Caterpillar," Vapourer Moth, Tortrix as eggs, and Capsid, give commercial control of Red Spiders and materially reduce infestation of Woolly Aphis and, to less extent, Codlin Moth and Tortrix as larvæ.

APPLICATION.

1. TIME.

(a) Tar-distillate washes should be applied as late as possible, consistent with safety, but in all ordinary cases trees should be thoroughly dormant. In normal season most apples and black currants can be sprayed up to the end of February. Other fruit trees and bushes should be sprayed before end of January, although in some localities spraying seasons for these may be prolonged a little into February.

It is common practice to winter prune trees before spraying. Where undercropping is practised, top trees should be sprayed as early as is necessary to avoid damage.

(b) To obtain highest degree of efficiency, petroleum oil washes should be applied as late as possible. Reliable washes can generally be applied with safety at 7½ to 10% during March to most varieties of apples and black currants, and on plums and other trees and bushes about a month earlier. They are not as injurious to undercropping as tar-distillate washes.

(c) Mixed tar-petroleum washes should also be applied as late as possible. On most apples and black currants, properly blended mixed washes can safely be applied at 10% during February. It is not advisable to apply mixed washes to other top fruits or bushes without previous small scale tests to verify their safety under particular local conditions. Mixed washes are much more injurious to undercropping than tar-distillate washes and great care should be exercised in their use.

2. MIXING (a, b, c).

An equal quantity of water should be added to amount of concentrate required and wash stirred until even cream results. Balance of water should be added while stirring and wash applied without delay. Large quantities of diluted wash should not be left standing overnight or during meal times. Accurate measures should be provided, mixing tubs should be clean and spraying water free from particles which might block nozzles. Drums of concentrate should be rinsed out when as much as possible has been drawn off.

It is essential that the concentrate should dilute properly. A *little* oil separation on surface is common and harmless, but if considerable separation takes place the reason should be sought. Exceptionally hard or otherwise abnormal waters may need specially prepared emulsions.

3. WEATHER (a, b, c).

Spraying should not be carried out in wet weather or when trees are damp, since moisture on tree prevents formation of efficient oil film. Concentrate should be protected from frost, and spraying in frosty weather avoided, if possible. Weather conditions should be chosen to allow of at least six hours dry weather after spraying, as it is essential that wash should dry off before rain occurs. If it is necessary to spray when trees are damp or light rain is falling, concentration should be increased by about 2½%. Spraying during windy weather should be avoided, as high wind makes it impossible for trees to be covered efficiently.

4. PRESSURE, EQUIPMENT AND AMOUNT OF WASH (a, b, c).

Wash should be applied as coarse drenching spray to whole of tree and *not* as fine mist. The high pressure necessary for Capsid control is not essential for ordinary winter washing, as eggs of commoner pests are not buried in bark and are more easily reached by spray than are Capsid eggs. Nevertheless, higher pressure gives better results, particularly against Red Spider, Woolly Aphis, Codlin Moth or Tortrix larvæ, since the wash must penetrate various coverings and reach the insects beneath.

Good hose and suitable connections designed to withstand high pressures, so that pump can work at maximum capacity, are essential. Size of disc, number and type of nozzle and type of lance or gun employed should allow trees to be drenched quickly and efficiently and tips of highest shoots properly sprayed.

Quantity of wash applied need not be as great as for petroleum wash used in Capsid spraying, unless it is desired to control Red Spider, Woolly Aphis, Codlin or Tortrix larvæ, when trees should be more thoroughly soaked than for ordinary winter washing.

5. METHOD OF SPRAYING AND POSITION OF OPERATOR.

(a) For routine spraying with tar-distillate washes the care employed in Capsid spraying is not absolutely necessary. Nevertheless, wash should be applied as much as possible against wind and other directions as regards method of spraying and position of operator, carried out as outlined in article on Capsid control in *The Fruitgrower* for October 18th, 1934.

(b, c) Petroleum oil washes or mixed tar-petroleum washes for Red Spider control should be applied in the same manner as Capsid washes.

We supply the following Winter Washes, made from the most suitable oils :—

Mortegg — **TAR-DISTILLATE WASH.** For General Winter Spraying.

Mortoyle — **PETROLEUM OIL WASH.** For Capsid and Red Spider Control.

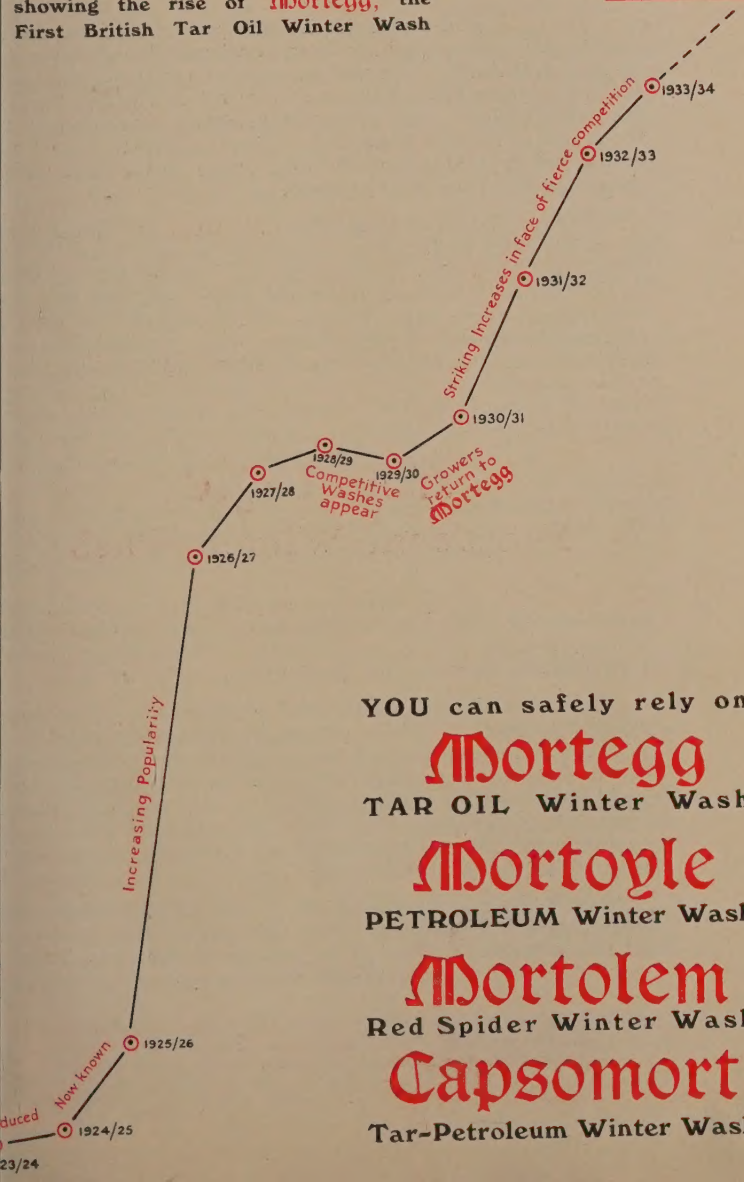
Capsomort — **TAR-PETROLEUM WASH.** For Capsid Control.

Mortolem — **TAR-PETROLEUM WASH.** For Red Spider Control.

Morteggraph

A striking and authentic Sales Graph showing the rise of Mortegg, the First British Tar Oil Winter Wash

THIS SPACE IS RESERVED FOR 1934-1935



YOU can safely rely on

Mortegg
TAR OIL Winter Wash

Mortoyle
PETROLEUM Winter Wash

Mortolem
Red Spider Winter Wash

Capsomort
Tar-Petroleum Winter Wash

Mortegg

Tar Oil Winter Wash

Mortegg is the premier British product of its type. T quality and efficiency have been confirmed beyond questi by Research Authorities and the whole Growing Communit Mortegg sales exceed those of any other Tar Oil Wash the British Isles—proof of its absolutely standard quality a the result of the use of special, refined and fractionated oi emulsified to yield maximum toxic action by virtue of uniq spreading and penetrating power.

The tar-distillates from which Mortegg is manufactur are of the same high boiling range now as they were in 19 when Mortegg was the only British Tar Oil Winter Wa on the market. It is manufactured under qualified technic supervision, from high boiling oils, emulsified to give a efficient oil deposit, highly resistant to rain and possessin maximum toxicity to insect eggs. Mortegg is the Standar

Mortoyle

Petroleum Winter Wash

Mortoyle is the most successful of the Specialise Petroleum Washes for efficient and economic Capsid Bu control. It is not offered as a Standard Winter Wash, thoug it has definite value against Red Spider.

This ovicidal wash has good wetting and penetrating properties, which enable it to deposit an even film of oil ove the surface of the bark, thus sealing the cap of the Capsid egg Mortoyle is manufactured from oils of high boiling range an the film produced is highly resistant to rain and harmless t trees and undercropping. These properties give the wash maximum toxicity against Capsid and Red Spider eggs, com bined with freedom from scorch.

Last season extensive Capsid Trials, carried out by our Entomological Department on the farms of six large commer cial Fruit Growers, showed an average of 94% control with Mortoyle. Full details of these Trials are available on request.

N.B.—Advisory Bulletin No. 7 deals fully with the questions o winter washing, concentrations required, technique o application and pests controlled.

Capsomort

Tar-Petroleum Winter Wash

Ever since Winter Washes were introduced, Growers have demanded one Wash to control all fruit tree pests. The problem is difficult, as the various pests controllable in the egg stage must be attacked in different ways. To meet this insistent demand, Capsomort was introduced. It is a blend of special petroleum and high-boiling neutral tar oils, outstandingly successful against Capsid and giving control of Caterpillar, Aphis and Psylla. The success of such a multiple wash involves careful attention to weather, dryness of tree and a sufficiently long dry period prevailing after spraying, to prevent washing-off before the film has de-emulsified. The wash must be diluted strictly according to instructions and applied with extra care and sufficient force, particularly to the small bud-bearing twigs.

Unless you can use Capsomort under these ideal conditions, we recommend Mortegg as the Standard Wash, followed a month or so later by Mortoyle Petroleum Wash, especially if Capsid be present. This programme is recommended for mixed orchards of plums and apples or where undercropping is practised.

Capsomort gave an average of 92% control of Capsid in experiments carried out by our Entomological Department at the farms of commercial Fruit Growers last season. Full details of these trials are available on request.

Mortolem

Tar-Petroleum Winter Wash

FOR RED SPIDER CONTROL

Reliance on Standard Winter Washes alone, and the occasional omission of Lime Sulphur Spring and Summer sprayings, have given Red Spider an opportunity of developing. This persistent and increasing pest can be very satisfactorily controlled by the use of Mortolem, a special wash based on a combination of various petroleum and tar oils, primarily intended for Red Spider, at the same time giving a high percentage control of Aphis, Psylla, Caterpillar and Capsid.

Mortolem requires even more thorough application than Standard Washes, because of the rather inaccessible places where Red Spider eggs are usually laid.

N.B.—Advisory Bulletin No. 7 gives full details of Tar-Petroleum Winter Washes, concentrations required, technique of application and pests controlled.

FOR some time past we have issued Advisory Bulletins giving the latest recommendations for the control of Insect Pests and Fungus Diseases. These Bulletins have been so widely appreciated that we have issued one dealing with the several types of Winter Washes now in common use. Another will be ready shortly, dealing with the control of Capsid Bug by winter washing, based on actual research work carried out over several seasons.

These Bulletins are essentially technical and contain valuable information for users of any type of Winter Wash—but for best results use a MURPHY WINTER WASH, follow the advice given in the Bulletins and thus obtain the highest degree of control.

When you buy the best Winter Wash you give equal attention to each of three essential factors ———

HIGHEST QUALITY *at*
LOWEST PRICE *and*
BEST SERVICE

——— *you buy* ***Murphy's***

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1933. **75**% of the PRIZE WINNERS used MORTEGG.

THE MURPHY CHEMICAL COMPANY LIMITED

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